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II. EXECUTIVE SUMMARY

a. Project Title

Genetic comparison of stocks considered for re-establishing steelhead *Oncorhynchus mykiss* in Clear Creek, a tributary to the Upper Sacramento River.

Applicant Name

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Principle investigators: Kevin Niemela and Matt Brown

b. Project Description and Primary Biological/Ecological Objectives

The goal of this project is to obtain fine-scale information on genetic diversity of several stocks of steelhead/rainbow trout *Oncorhynchus mykiss* from Coleman National Fish Hatchery; the mainstem Upper Sacramento River; and Mill, Deer, and Clear Creeks, three tributaries to the Upper Sacramento River. Information gathered will be used primarily to determine the preferred source (most similar to native Clear Creek steelhead) of a founding stock for re-establishing a self-sustaining steelhead population in Clear Creek following the removal of McCormick-Saeltzer Dam in 1999. Results of this research will be used to facilitate re-establishment of a steelhead run in Clear Creek, while at the same time maintaining or improving the genetic integrity of the Upper Sacramento River population. Methods considered for re-establishing a steelhead population in Clear Creek are: 1) allowing strays from the Upper Sacramento River to repopulate; 2) stocking steelhead (juveniles or returning adults) from Coleman NFH; and, 3) trans-locating offspring of "native" resident rainbow trout from isolated, residualized populations in upper Clear Creek, above Whiskeytown Dam. The proposed study will provide information to determine the most appropriate method of steelhead reintroduction, and will also provide: 1) information regarding the utility of the Coleman NFH steelhead for this and subsequent re-introduction efforts; and, 2) information regarding temporal stability of allele frequencies in steelhead from tributaries to the Upper Sacramento River.

c. Approach/Tasks/Schedule

Field work for this project will begin with collection of tissue samples from steelhead adults returning to Coleman National Fish Hatchery in January, 1999. Tissues will be collected from naturally spawning steelhead/rainbow trout adults and juveniles at alternative sample locations in upper and lower Clear Creek, the Upper Sacramento River, Mill Creek, and Deer Creek through the 1999 spring emigration period. Nuclear microsatellite DNA analysis will be coordinated to follow immediately after sample acquisition for each of the various locations sampled. Data evaluation and project completion reports will be completed during calendar year 1999.

d. Justification for Project and Funding by CALFED

Steelhead are federally listed as a threatened species and are considered a 1st tier priority species by the CALFED Bay/Delta Program. Clear Creek is commonly viewed as providing excellent restoration potential in the Upper Sacramento River. A previous CALFED grant has been awarded to fund the removal of McCormick-Saeltzer dam, a steelhead migration barrier in Clear Creek. Removal of this dam will allow steelhead access to the only spawning and year-round rearing habitat in the tributary. Evidence suggests, however, that limitations of straying into the

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newly-available habitat will prevent re-establishment of a viable population (low straying rate, "genetic bottleneck"). Information gained through this investigation will allow for an informed management decision to be made regarding the preferred (most similar to native Clear Creek steelhead) founding steelhead population in Clear Creek, facilitating timely re-establishment of a steelhead population in the tributary.

e. Budget Costs and Third Party Impacts

Project costs will be $45,493 for the complete study design as proposed, and $34,195 for the alternate (minimal) study design. There are expected to be no third party impacts.

f. Applicants Qualifications

Northern Central Valley Fish and Wildlife Office (NCVFWO) was established in 1978 as part of the U.S. Fish and Wildlife Service's responsibility to facilitate restoration of Pacific Salmonids. Specific goals of the NCVFWO are to: 1) stabilize or increase the runs of anadromous salmonids in the Sacramento River System; 2) improve the effectiveness of federal fish propagation facilities in California and Nevada; 3) protect and restore the productivity of natural habitats in the Sacramento River system; and, 4) continue development of information and strategies for protecting the natural habitats of the Sacramento River system as migration routes, spawning areas, and nursery areas for anadromous salmonids. The staff consists of 30 biologists and support personnel which have substantial experience working in the Upper Sacramento River and its' tributaries.

g. Monitoring and Data Evaluation

This proposal for research has no associated monitoring program. Peer review will be utilized in the study design, data evaluation, and reporting process.

Local Support/Coordination with Other Programs/Compatibility with CALFED Objectives

This proposed research is supported by the local watershed planning group, the Clear Creek Coordinated Resources Management Program, fisheries subcommittee. This research will benefit several current steelhead restoration planning documents including; *Anadromous Fish Restoration Plan, Central Valley Salmon and Steelhead Restoration and Enhancement Plan, Restoring Central Valley Streams: A Plan for Action, Steelhead Restoration and Management Plan for California.* This proposed research will complement with minimal redundancy current and proposed steelhead genetics research conducted by DFG and Dr. Nielsen.